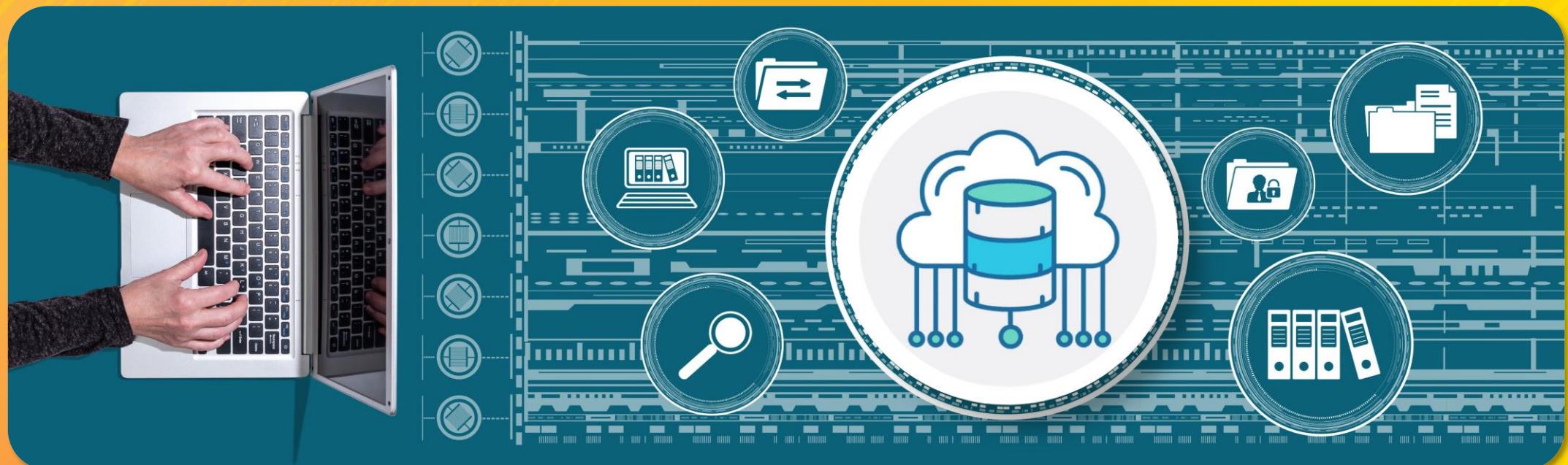
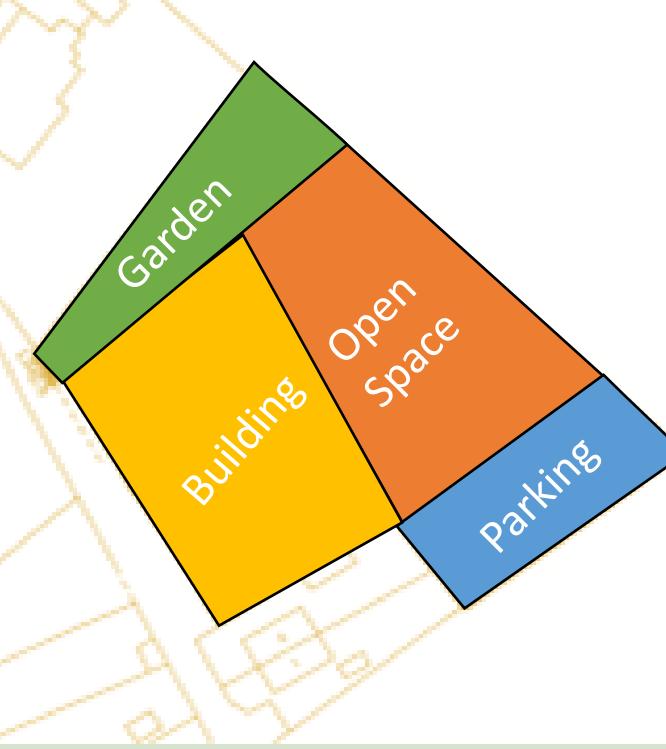
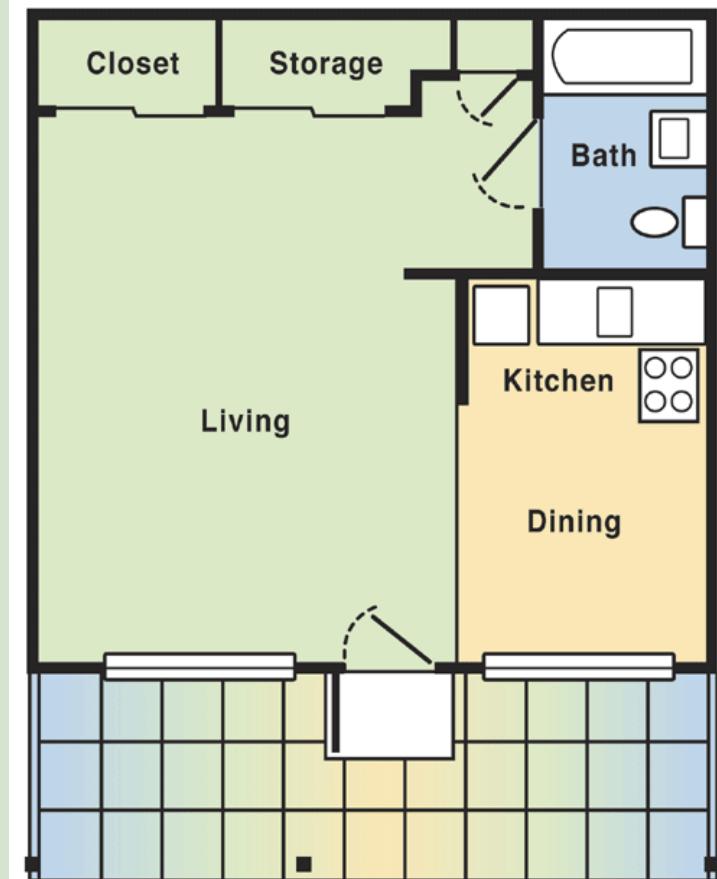




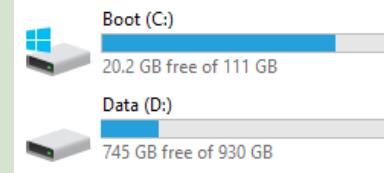
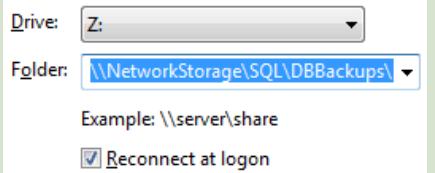
Storage in Cloud



Storage Types

Block Storage	File Storage	Object Storage
<p>A Piece of Land</p> 	<p>An Apartment</p> 	<p>Storage Unit</p>  

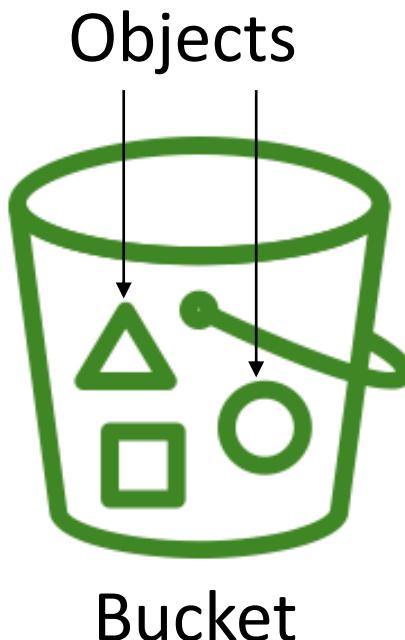
Storage Types

	Block Storage	File Storage	Object Storage
Unit of Transaction	Blocks	Files	Objects (files with metadata)
Example	<p>Laptop Disk</p> 	<p>Windows Share</p> 	<p>OneDrive / Google Drive / Dropbox</p> 
How can you update?	You can directly update the file	You can directly update the file	<p>You cannot update the object directly.</p> <p>You create a new version of the object and replace the existing one or keep multiple versions of the same object.</p>
Protocols	SCSI, Fiber Channel, SATA	SMB, CIFS, NFS	REST/SOAP over HTTP/HTTPs
Support for metadata	No metadata support it stores only file system attributes	No metadata support it stores only file system attributes	Supports custom metadata
AWS Services	Amazon EBS Amazon Instance Store	Amazon EFS Amazon FSX	Amazon S3 Amazon Glacier



Amazon Simple Storage Service
(Amazon S3)

Buckets and Objects



- Buckets are containers for data stored in S3.
- Objects are the fundamental entities stored in Amazon S3.
- S3 Name Space is global, Buckets are regional.
- Durability – 99.999999999 %
- Availability – 99.9x %



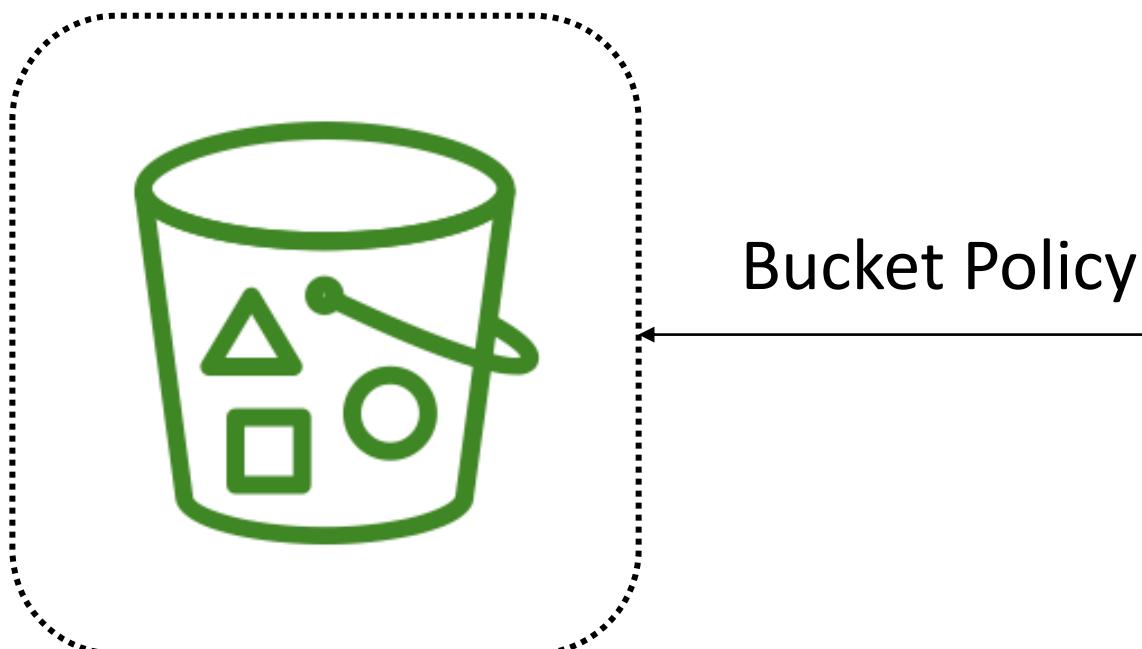
Bucket Policy



Amazon Simple Storage Service
(Amazon S3)

Bucket Policy

- The bucket policy, written in JSON, provides access to the objects stored in the bucket.



Bucket Policy

```
{  
  "Id": "Policy1675378587932",  
  "Version": "2012-10-17",  
  "Statement": [  
    {  
      "Sid": "Stmt1675378555005",  
      "Action": [  
        "<API Request>"  
      ],  
      "Effect": "<Allow/Deny>",  
      "Resource": "<Bucket-ARN>",  
      "Principal": "<Identity>"  
    }  
  ]  
}
```

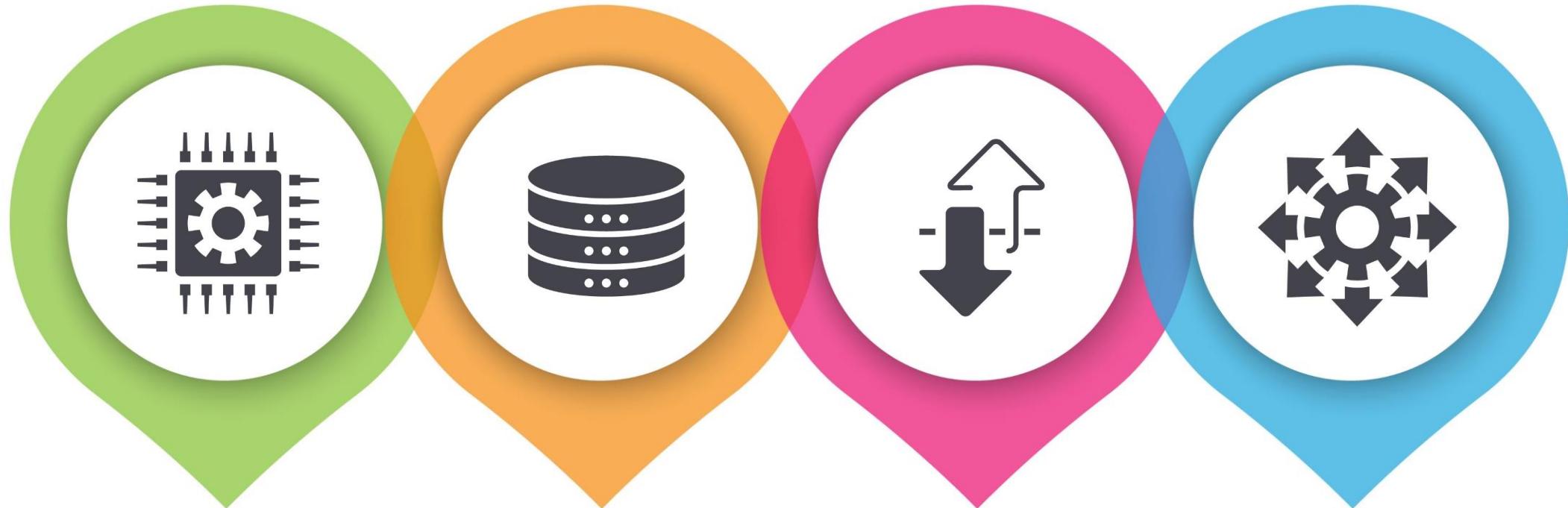


Pricing



Amazon Simple Storage Service
(Amazon S3)

AWS Pricing



Processing
(Compute)

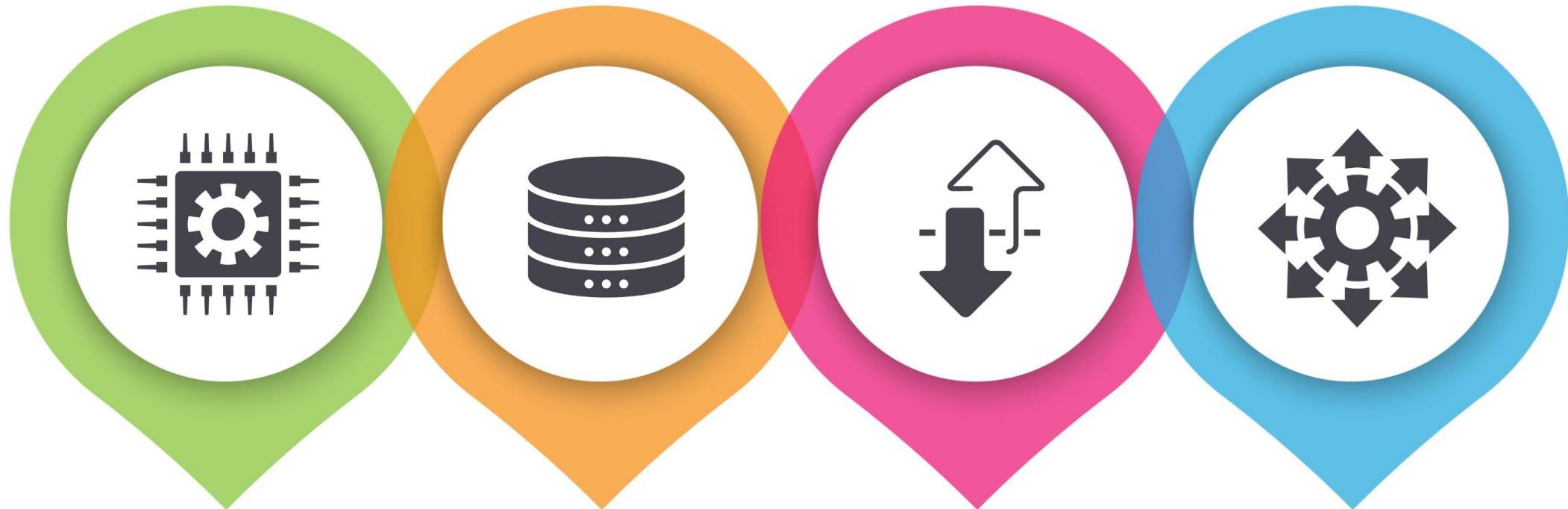
Storage
(Capacity)

Network
(Data Transfer) **Other**
(Service Specific)

<https://aws.amazon.com/<Service>/pricing>



Amazon S3 Storage Pricing



Compute

No. of requests

Storage

Space Used

Data Transfer

Download

Other

Monitoring

[AWS Pricing Calculator](#)





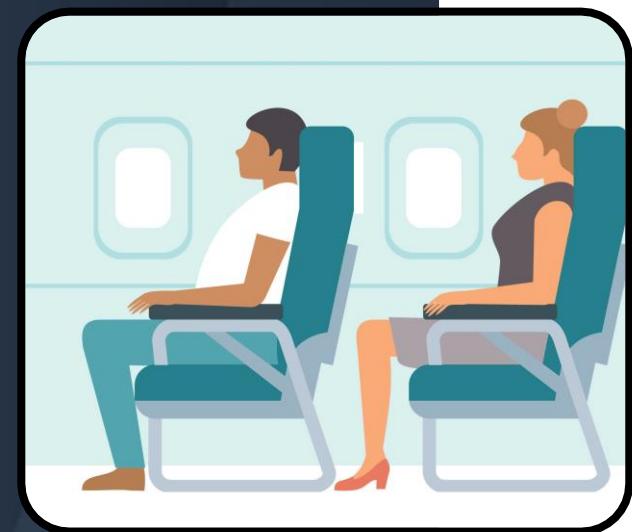
Storage Class



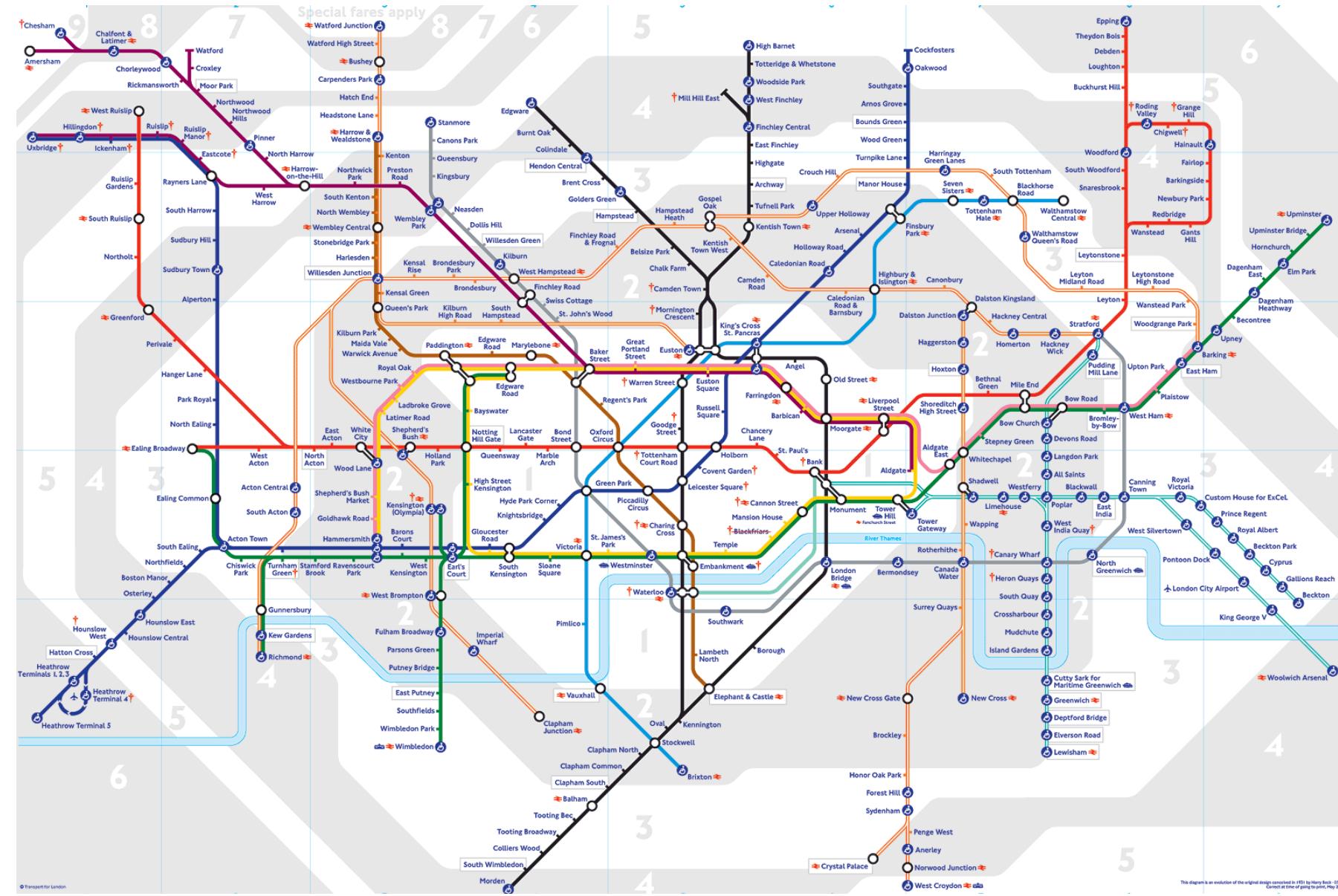
Amazon Simple Storage Service
(Amazon S3)

Amazon S3 Storage Class

- Amazon S3 offers a range of storage classes for the objects that you store.
- You choose a class depending on your use case scenario and performance access requirements.



London Transport Zones

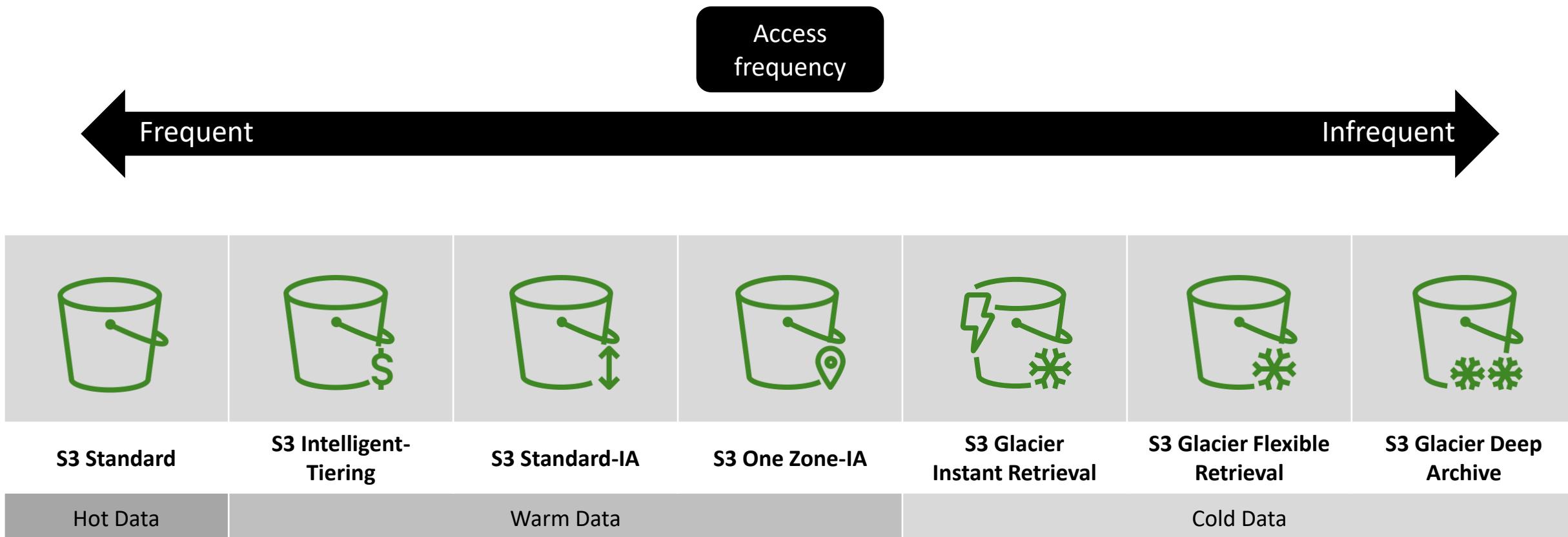


Amazon S3 Storage Class

- Amazon S3 offers a range of storage classes designed for different use cases.
 - <https://aws.amazon.com/s3/storage-classes/>



Amazon S3 Storage Class



Amazon S3 Storage Class

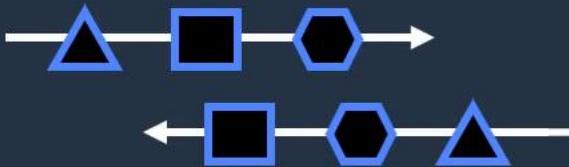
Storage class	Designed for	
Standard	Frequently accessed data (more than once a month) with milliseconds access	
Intelligent-Tiering	Data with changing or unknown access patterns	
Standard-IA	Infrequently accessed data (once a month) with milliseconds access	
One Zone-IA	Recreatable, infrequently accessed data (once a month) stored in a single Availability Zone with milliseconds access	
Glacier Instant Retrieval	Long-lived archive data accessed once a quarter with instant retrieval in milliseconds	
Glacier Flexible Retrieval (formerly Glacier)	Long-lived archive data accessed once a year with retrieval of minutes to hours	
Glacier Deep Archive	Long-lived archive data accessed less than once a year with retrieval of hours	
Reduced redundancy	Noncritical, frequently accessed data with milliseconds access (not recommended as S3 Standard is more cost effective)	

Amazon S3 Intelligent-Tiering



S3
Intelligent-Tiering

- Optimizes costs by moving objects between four access tiers when access pattern changes



Access patterns are monitored to automate object movement between access tiers



Frequent Access Tier

Objects uploaded or transitioned to S3 Intelligent-Tiering are automatically stored in the frequent access tier



Infrequent Access Tier

Objects not accessed for 30 consecutive days



Archive Access Tier

Objects not accessed for 90 consecutive days



Deep Archive Access Tier

Objects not accessed for 180 consecutive days

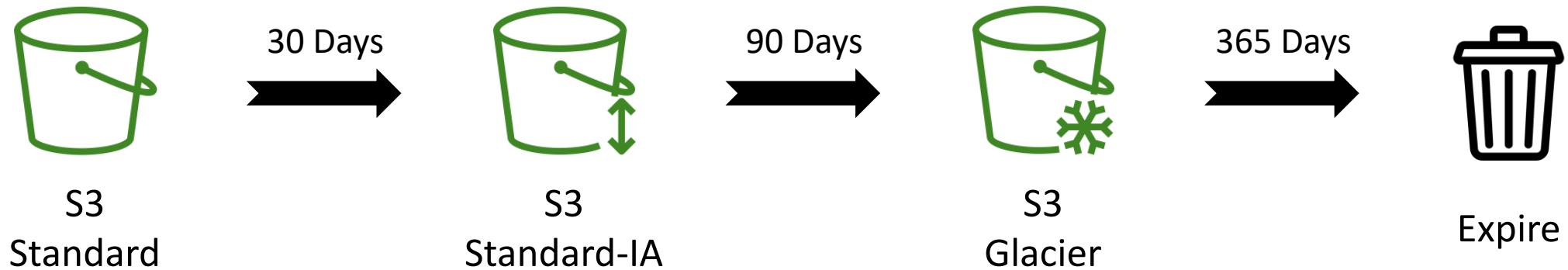
Data Access

Any time an object is accessed, S3 Intelligent-Tiering moves the object back to the Frequent Access Tier



Amazon S3 Life Cycle Policies

- Storing objects cost effectively throughout their lifecycle





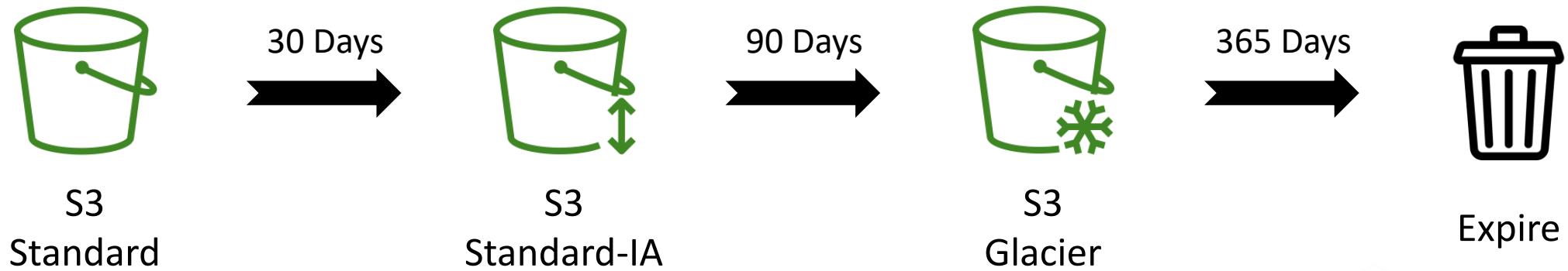
S3 Life Cycle Policies



Amazon Simple Storage Service
(Amazon S3)

S3 Life Cycle Policies

- Storing objects cost effectively throughout their lifecycle



EBOOK

**How to optimize
storage costs using
Amazon S3**





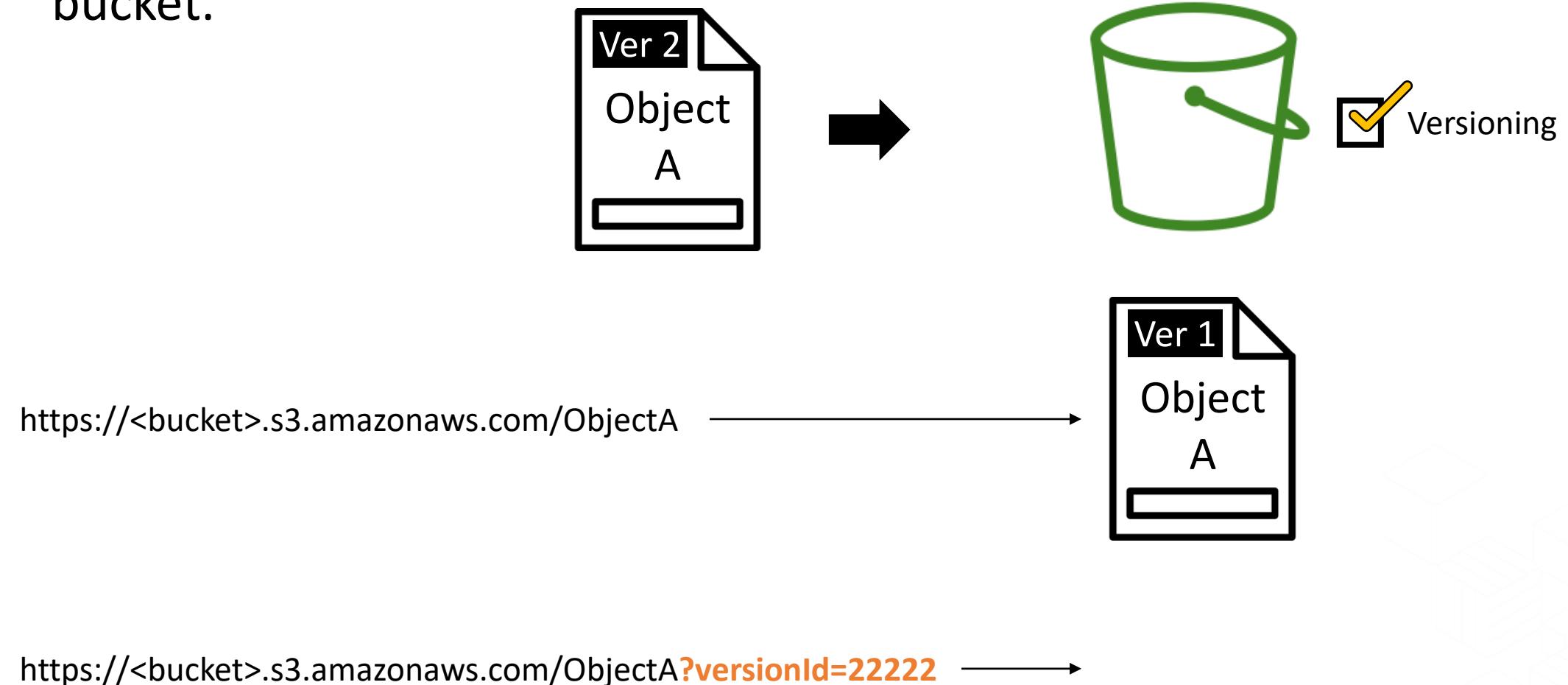
Bucket Versioning



Amazon Simple Storage Service
(Amazon S3)

Bucket Versioning

- Versioning is a means of keeping multiple variants of an object in the same bucket.





Replication rules



Amazon Simple Storage Service
(Amazon S3)

Replication Rules

- Replication enables automatic, asynchronous copying of objects across Amazon S3 buckets.
- It requires versioning to be enabled.
- You can replicate data from one source bucket to multiple destination buckets.
- Supports cross-account and cross-region replication.





Transfer acceleration



Amazon Simple Storage Service
(Amazon S3)

Transfer acceleration

- Transfer Acceleration takes advantage of the globally distributed edge locations in Amazon CloudFront.

- As the data arrives at an edge location, the data is routed to Amazon S3 over an optimized network path.





S3 Glacier



Amazon S3 Glacier (S3 Glacier)



Glacier

WordWeb

Bookmarks Copy Search View Options Help

glacier

WordWeb Wikipedia Wiktionary WordWeb Online

Noun: glacier gley-shur [N. Amer], gla-see-u(r) or gley-see-u(r) [Brit]

1. A slowly moving mass of ice



Amazon S3 Glacier

- A storage service optimized for infrequently used data, or "cold data"
- Suitable for data archiving and backup



Amazon S3 Glacier



Amazon S3 Glacier - Vault and Archive

- A vault is a container for storing archives, and an archive is any object, such as a photo, video, or document, that you store in a vault.
- An archive is the base unit of storage in S3 Glacier.

S3	Glacier
Bucket	Vault
Object	Archive
Object Size Max 5 TB	Object Max 40 TB

- Any archive operation, such as upload, download, or deletion, requires you to use the AWS Command Line Interface (CLI) or write code. There is no console support for archive operations.



Amazon S3 Glacier

- You can choose from three archive storage classes optimized for different access patterns and storage duration.



S3 Glacier Instant Retrieval

Low-Cost

Milliseconds retrieval of data



S3 Glacier Flexible Retrieval

Lower-Cost

Minutes to 12 hours retrieval of data



S3 Glacier Deep Archive

Lowest-Cost

12-48 hour retrieval of data

What?

- Amazon S3 Glacier is a storage service optimized for infrequently used data, or "cold data". The service provides durable and extremely low-cost storage with security features for data archiving and backup.
- S3 Glacier is one of the many different storage classes for Amazon S3.

Why?

- Amazon S3 Glacier enables you to offload the administrative burdens of operating and scaling storage to AWS, so you don't have to worry about capacity planning, hardware provisioning, data replication, hardware failure detection and recovery, or time-consuming hardware migrations.

When?

- You want to store your data cost effectively for months, years, or even decades.
- You need to use query-in-place functionality, allowing you to run powerful analytics directly on your archived data at rest.



Amazon S3 Glacier

Where?

- Amazon S3 Glacier is a regional service.
- Your data such as a photo, video, or document (called Archive) is stored in a Vault in your selected region.
- Data is redundantly stored across multiple Availability Zones that are physically separated within an AWS Region.

Who?

- You can choose from three storage classes optimized for different access patterns and storage duration - S3 Glacier Instant Retrieval (milliseconds retrieval), S3 Glacier Flexible Retrieval (retrieval in minutes or free bulk retrievals in 5-12 hours), S3 Glacier Deep Archive (retrieval within twelve hours).

How?

- S3 Glacier provides a management console. You can use the console to create and delete vaults. However, all other interactions with S3 Glacier require that you use the AWS CLI or write code.
- You can initiate a S3 Glacier job to perform a select query on an archive, retrieve an archive, or get an inventory of a vault.

How much?

- S3 Glacier charges are calculated based on monthly storage (GB-Month), number of requests (based on the request type), and data retrievals (per GB). Incoming transfers are free.
- Amazon S3 Glacier has minimum capacity charges for objects depending on the storage class you use.